A researcher in personality and psychometry, after a thorough scrutiny of human characteristics, located eighty personality scales which presumably provide a com1prehensive description of human personality. He administered these scales to a sufficiently large sample (N = 1000) and obtained the intercorrelations among the, Eighty scales. The researcher wanted to factor analyse these scales. Retaining unities in the diagonal spaces of the 80 80cor1relation matrix, the unrotated factors were extracted. Using various criteria for deciding the number of factors for rotation, fifteen factors were retained. The fifteen factors together explained 70% of the total variance. These fifteen factors were rotated by following a suitable method and the resulting inter-correction matrix was examined. Several of the inter-factor correlations were fairly high. Second-order factor analysis was then carried out which yield ed five, nearly orthogonal factors.

46. While factor-analysing the 80 80correlation matrix, out of the following four factor extraction methods, which one has probably been employed in the above work?

a). Least square method
b). Confirmatory factor analysis method
c). Principal axes method
d). Principal components method

47. Which one of the following is not the criterion for deciding the number of factors for rotation?

a). Cattell's Scree
b). Guttmann's root ≥ 1 criterion
c). Percentage of total variance explained by the factor solution
d). Wilks' criterion

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48. Out of the following four factor rotation methods, which method/s can yield the above reported results?

1). Oblimin rotation
2). Varimax rotation
3). Promax rotation
4). Quartimax rotation

1 and 2 only
b). 1 and 3 only
c). 2 and 3 only
d). 2 and 4 only

Which of the following condition/s is/are necessary for carrying out second-order factor analysis?

1). It is hypothesized that there are a few orthogonal second-order factors.
2). The first-order factors should have been obliquely rotated.
3). At least, some of the inter-factor correlations should be fairly high.
a). 1 and 2 only
b). 1 and 3 only
c). 2 and 3 only
d). 1, 2 and 3

50. The two factors are said to be orthogonal, when the angle of separation between the two factors is

a). 90 degrees
b). lesser than 90 degrees
c). greater than 90 degrees
d). in between zero to 180 degrees

Instruction. Read the following paragraph and answer the five questions which follow. A researcher working in the vocational interests surveyed different interest assessment tools and after a careful scrutiny selected 68 scales presumably covering all areas of vocational interests. He administered all these scales to a large sample (N=750). The researcher correlated every scale with every other scale and obtained correlation matrix. The correlation matrix, without altering any of the diagonal elements, was factor analysed and the unrotated factors were extracted. The cattell's scree suggested 11 factors, whereas Kaiser-Guttman's criterion suggested 14 factors for further rotation. The eleven factors explained 72 percent of variance. The eleven factors were varimax-rotated. After examining the results and discussion, the researcher decided to carry out the second-order factor analysis. He, therefore, re-rotated the eleven factors and found that some of the inter-factor correlations were fairly high. The second-order factor analysis suggested three second-order factors which were fairly interpretable.

96. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R). Read the statements and choose the correct answer choosing from the code given below:
1. Assertion (A): In the above work, the researcher preferred cattell's screeplot over Kaiser- Guttman's criterion.
2. Reason (R): Even with a small number of variables, Kaiser-Guttman's criterion always leads to the extraction of more factors, as compared to cattell's scree.

Options-

1). Both (A) and (R) are true, but (R) is not the correct explanation of (A).
2). (A) is true, but (R) is false. 3). Both (A) and (R) are true, but (R) is the correct explanation of (A). 4). (A) is false, but (R) is true.

97. During re-rotation of the first-order factors, which of the following methods is/are likely to have been used?

i). Oblimin
ii). Promax
iii). Quartimax
iv). Equamax

Choose the correct answer from the code given below:
Options-
1). (ii), (iii) and (iv)
2). (i) and (ii)
3). (iii) and (iv)
4). Only (i)

98. Which of the following factors extraction methods have not been used in the above work while extracting the first-order factors?

i). Principle axes method
ii). Principle components method
iii). Maximum likelihood method
iv). Generalized least squares method

1. Choose the correct answer from the code given below:
Options-
1). (ii) and (iv)
2). (i), (iii) and (iv)
3). (i) and (iii)
4). (ii) and (iii)

99. The three second-order factors would explain of the variance among 68 scales.

Options-
1). More than 72 percent
2). 72 percent
3). 100 percent
4). Less than 72 percent

read the statements and choose the correct answer choosing from the code given below:
1. Assertion (A): In the above work, the researcher preferred cattell's scree plot over Kaiser-Guttman's criterion.
2. Reason (R): The angles of separation among varimax-rotated factors are non-ninety.

3. Options:
1). Both (A) and (R) are true, but (R) is the correct explanation of (A).
2). (A) is true, but (R) is false.
3). (A) is false, but (R) is true.
4). Both (A) and (R) are true, but (R) is not the correct explanation of (A).

An educational psychologist wanted to develop an achievement test in physics for graduate students. After going through the usual test construction procedure, he retained 100 items; each item having five alternatives, one of them being correct. The psychologist wanted to examine the factor structure of the resulting achievement test. Using a sample of 1,000 subjects, the psychologist obtained the inter-item correlations. He obtained the initial estimates of communality and then decided to factor analyse the inter-item correlations matrix by following the common-factor model. He extracted the unrotated factors and retained the first nine factors for rotation. The nine unrotated factors explained 67.5 percent of variance. After factor rotation, all the inter-factor correlations were found to be zero. The factor structure of the achievement test of physics was found to be interpretable.

96. The inter-item correlations would be:
1). Biserial correlations
2). Kendall's tau
3). Phi-coefficients
4). Point-biserial correlations

97. Read each of the following statements –

Assertion (A) and Reason (R); and indicate your answer using code given below:
Assertion (A): For the factor analysis of item scores, Common-Factor model is quite often more suitable.
Reason (R): Item scores are quite often less reliable than the psychometrically measured trait variables.

Code:
1). Both (A) and (R) are true, and (R) is the correct explanation of (A).
2). Both (A) and (R) are true, but (R) is not the correct explanation of (A)
3). (A) is true, but (R) is false.
4). (A) is false, but (R) is true.

98. Which one of the following methods of factor extraction, the psychologist would NOT use in the present study?
1). Principal axes method
2). Principal components method
3). Psychometric (alpha) factor analysis
4). Maximum likelihood method

99. Which method/s of rotation has/have most probably been used in the present study?

a). Oblimin
b). Promax
c). Quartimax
d). Varimax

Code:

1). (a) only
2). (c) only
3). (c) and (d) only
4). (b), (c) and (d) only 100.

The second-order factor analysis of the nine rotated factors is not recommended in the present study because:

1). There are only nine first-order factors.
2). The inter-factor correlations are zero.
3). The factors obtained by common-factor model are not subjected to second-order factor analysis.
4). Unrotated factors are more suitable for second-order factor analysis

The Wechsler Adult Intelligence Scale (WAIS) was administered to a sample of 300 subjects. The inter-correlations among all the subscales were obtained. Unities were retained in the diagonal spaces of the correlation matrix and it was factor analysed. Cattell's scree indicated two-factor solution. The two factors were subjected to varimax rotation. The two rotated factors were named as Verbal Intelligence and Performance Intelligence. The two factors, together, explained 62 percent of variance.

71. Which one of the following methods of factor extraction is likely to have been employed in the present work?

a). Principal component analysis
b). Principal axes factoring
c). Maximum likelihood
d). Unweighted least squares

The inter-factor correlation between the two rotated factors obtained in this analysis will be

a). Greater than zero
b). Smaller than zero
c). Zero
d). Zero or greater than zero

73. Cattell's scree is a

a). Plot displaying variables choosing from the first two factors as axes.
b). Plot of the order of unrotated factors on X axis and eigenvalues on Y axis.
c). Plot of the order of unrotated factors on X axis and the communalities on the Y axis.
d). Eigenvalues on X axis and communalities on Y axis.

74. The factor-analytic model followed in the above analysis can be best labelled as

a). Common factor model
b). Confirmatory factor analysis model
c). Oblique factor analysis model
d). Component model

75. In this research, the factor analysis has

a). Established the predictive validity of the WAIS.
b). Explored the dimensionality of the WAIS subscales.
c). Provided evidence in favour of Spearman's two factor model.
d). Demonstrated that all the WAIS subscales are highly internally consistent.

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By Dr. Farah